USING GIS FOR A DATABASE ON AGRICULTURAL LAND

Anca Alina LAZĂR, assistant univ., „Gheorghe Asachi" Technical University of Iasi, Romania, anca_danut@yahoo.com
Dan PĂDURE, assistant univ., „Gheorghe Asachi" Technical University of Iasi, Romania, danny_pad@yahoo.com
Costinela PÎRVU, assistant univ., „Gheorghe Asachi" Technical University of Iasi, Romania, costinelapirvan@yahoo.com

***Abstract**: Because of the need to integrate, manage and interpret large volumes of data and due to the rapid development of information technology, geographic information systems (GIS) are useful areas dealing with spatial information. This paper presents a case study that aims to realize a database for managing agricultural land. Consulting quickly cadastral documents whose data and information are continuously updated, is possible only if these documents are computerized.*
***Keywords:** information system, agricultural land, agricultural cadastre.*

1. Introduction

Geographic Information Systems or GIS plays an important role in the integration, management and analysis cadastral data. GIS technology integrates common database operations such as query and statistical analysis with the unique advantages offered by maps for visualizing and analyzing geographic spatial data [1]. The applicability of GIS is virtually unlimited for the vast majority of human activities, an important feature being location in space.

Creating a spatial database related to a geographical area is carried out using a GIS software that has a user interface which performs queries and spatial analysis whose results are represented graphically in the form of charts, drawings, maps and reports [2].

2. Description of study area

In the paper was selected as study area properties located in six sectors cadastral (4/1, 5/1, 6/1, 7/1, 8/1, 11/1) located in the cadastral plan in unincorporated territorial administrative unit of the commune Ţuţora (Fig. 1). The studied land is in the northwest of the unincorporated territorial administrative unit of the commune Ţuţora and include plots of agricultural plain located in the joint of two rivers Prut and Jijia on the left side of Jijia. Prut River flows at a distance from 1.5 to 2.6 km from the study area and the river Jijia flows near the studied area, delimiting it from the west (Fig. 2). Both rivers are dammed, their influence being felt on groundwater. Due embankment works that were performed on the two rivers no longer floods. A disadvantage is that an area of agricultural land will be removed.

Automating complex is the main quality of a modern cadastre meaning only digital data obtained in absolutely all phases of cadastral works. Automating complex assumes obtaining an digital cadastral plan with specific forms of digital data. Further objective is the digital cadastral plan (Fig. 3) as part of the main steps required to go namely: data processing and reporting.

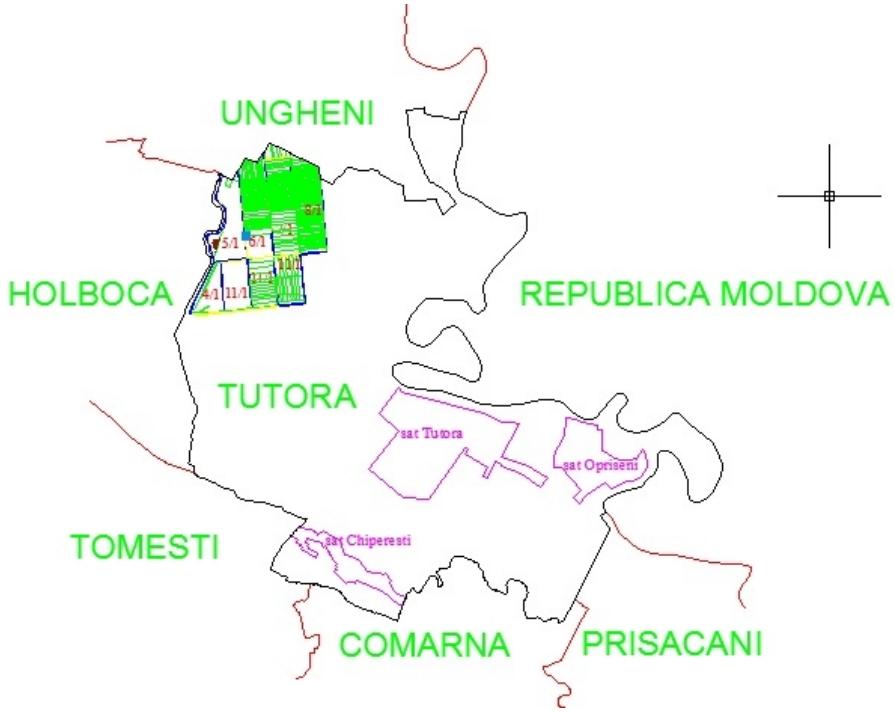

Fig. 1. Location of the study area in the UAT Ţuţora

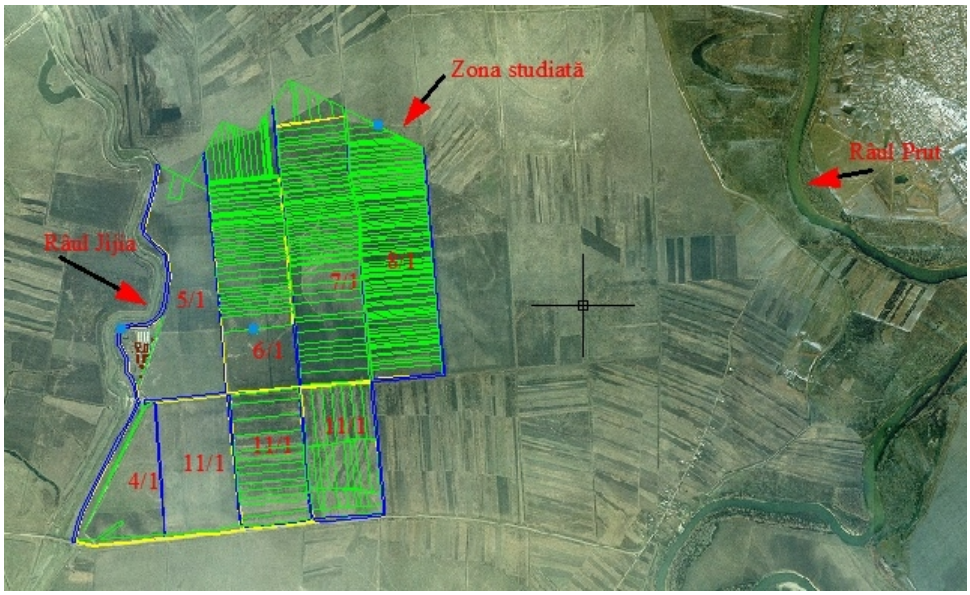

Fig. 2. Frame orthophotomap study area

Stages of work carried out at the office for developing digital cadastral plan, are the normal sequence, the following:

• Data processing results of measurements to obtain the coordinates of all points;

• Reporting planimetry respectively the characteristic points that define the details of the land surface;

• Binding in the drawing by joining points according to the sketch of the land, application of conventional signs, symbols;

• Finalizing the plan by writing toponymy, identification data, legend, etc.

In the case of an complex topographic plan and as required, reporting is done on thematic layers which, by synthesis, is achieved an overall plan and the representation of large surfaces is done in sections that will be connected according to the layout sketch sheets.

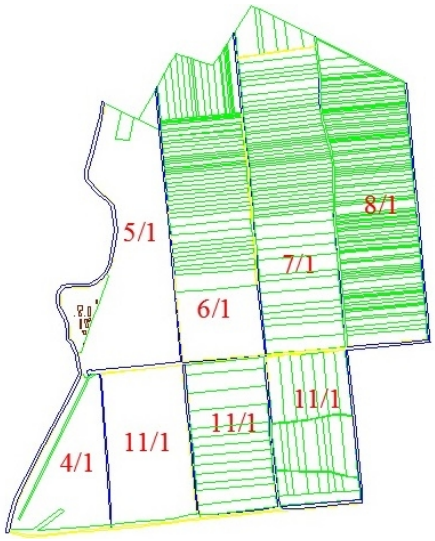

Fig. 3. Digital plan study area

The step of providing textual database

Using external database in the SIC allows working with large amounts of information. Alphanumeric database design was done in Microsoft Office Access by going through the following steps:

- structuring data tables to eliminate redundancy;
- defining the attributes tables and fields data type of each field;
- linking tables;
- loading data into tables;

Linking tables consists in creating links between database tables in order to make forms and loading data without errors. Networking involves selecting with the mouse the internal key of the first table, catching it and laying on the foreign key in the second table (Fig. 4).

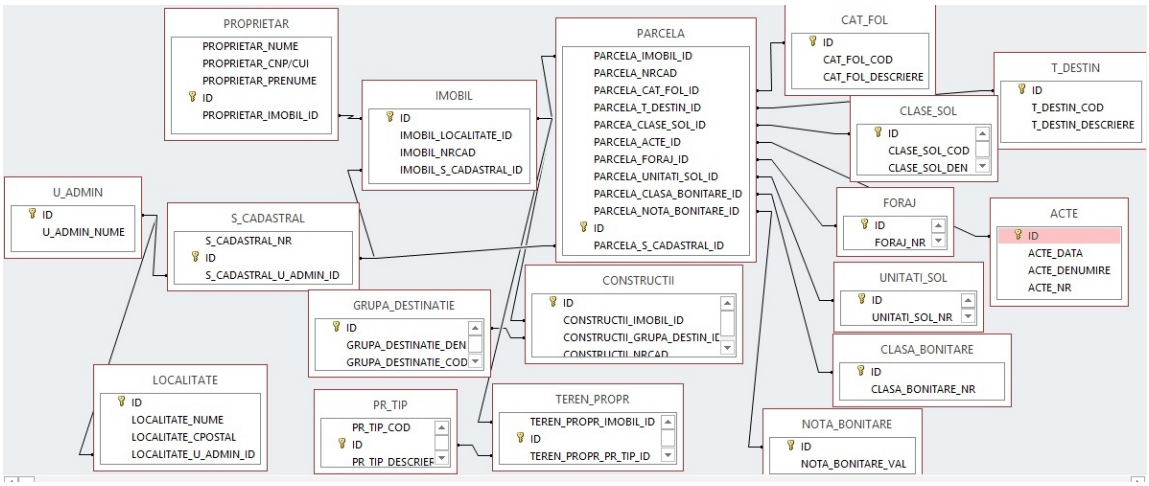

Fig. 4. Database „BD_TUTORA” relational

Linking graphics database with textual database in AUTOCAD

Attaching database to the current project was made to link the alphanumeric information to the graphic objects (parcels).

This process is performed in three steps, namely:

- Bringing the database in CIS (GIS): Map-Database-Data Sources-Attach and select its location. The database will be attached to the Workspace window (Fig. 5). In this phase, the database can be manipulated completed, but can not be designed (you can not create tables, add or delete columns).

- Is defined a link (link Template),a connection table with SIC application;

- The link records the data from the table to the graphic objects (parcels).

The link table within the project is made for the application SIC to recognize the table as part of it. The data attached to the centroid is transmitted in the connection of the parcels to view the query and polygonal outline of the parcel.

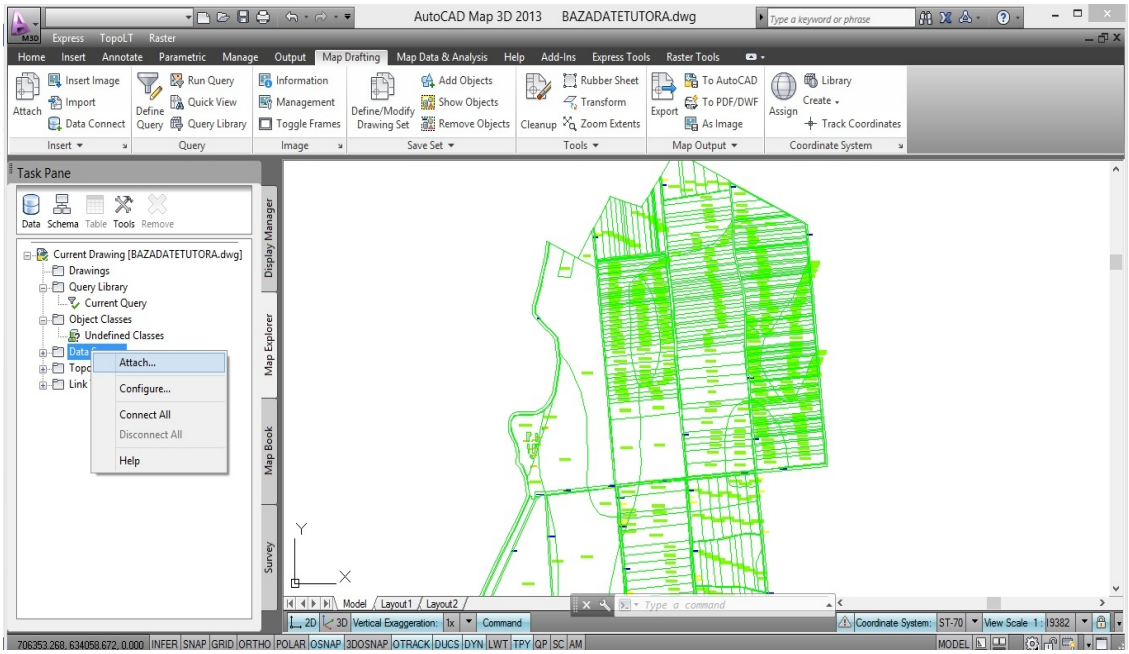

Fig. 5. Attaching external database

Spatial analysis

Queries are specialized procedures whereby we obtained textual and graphical answers to questions for which the information system was created. Analysis of the legal cadastre for the study area was carried out by an SQL query (Fig. 6).

The query type Property uses as criteria for selection the characteristic objects displayed in the Property Condition window. To show land areas larger than 10 ha I made a query by property type (Fig. 7).

Creating thematic maps is a query process by which presents characteristics of objects charted, through graphics, presentation that is effective and easy to read maps.

For the study area were made the following thematic maps:

- Thematic maps on land use and use categories (Fig. 8);
- Thematic map on the distribution of land quality classes (Fig. 9);
- Thematic Map on dividing land soil units (Fig. 10);
- Thematic Map on land ownership by type of documents (Fig. 11).

Fig. 6. The result of the SQL query for land belonging to the state

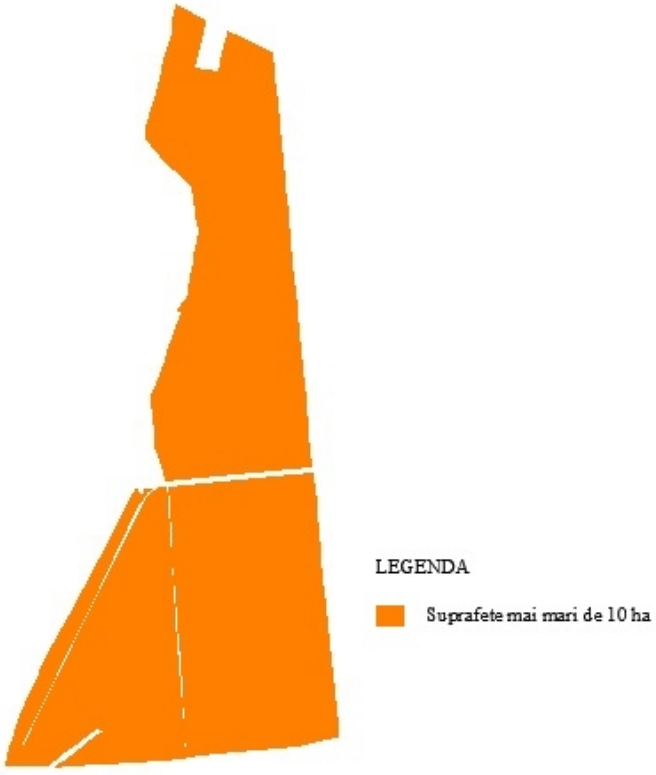

Fig. 7. Query result area > 10 ha

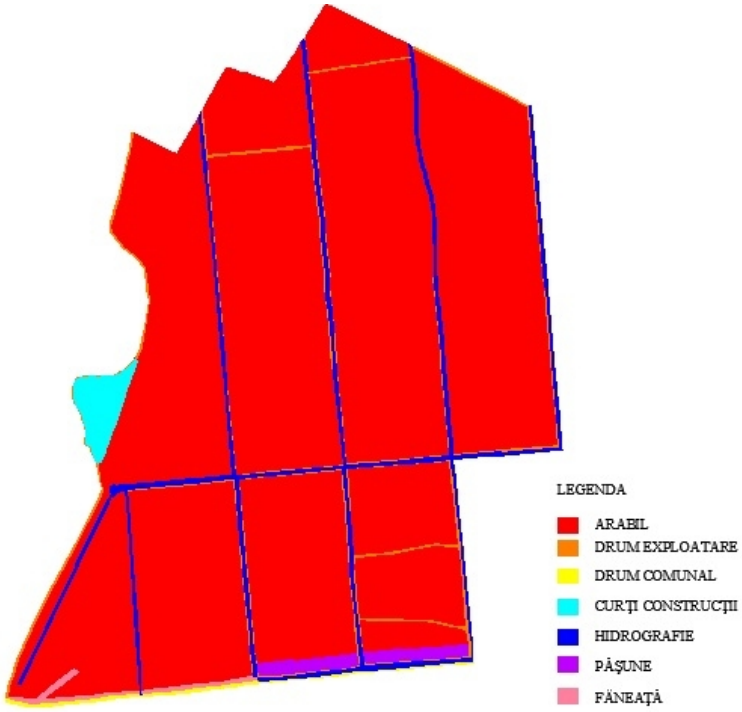

Fig. 8. Thematic maps on land use and use categories

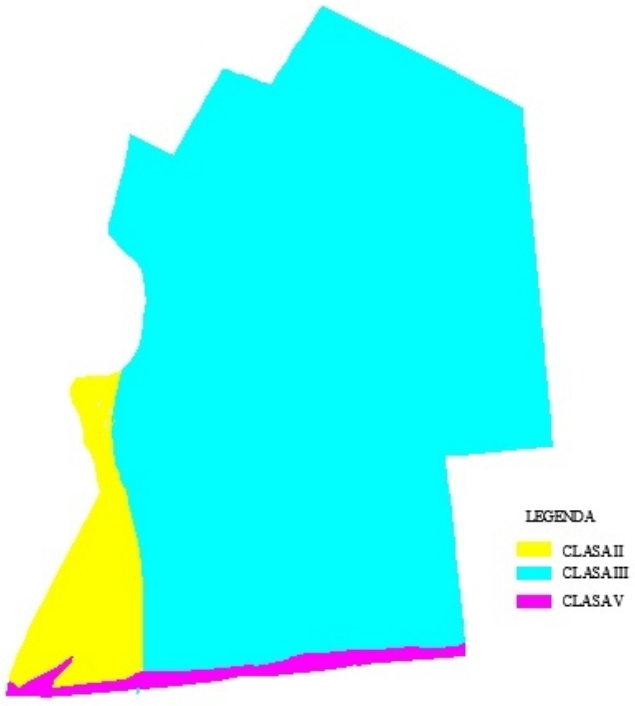

Figure 9 Thematic maps on land quality classes

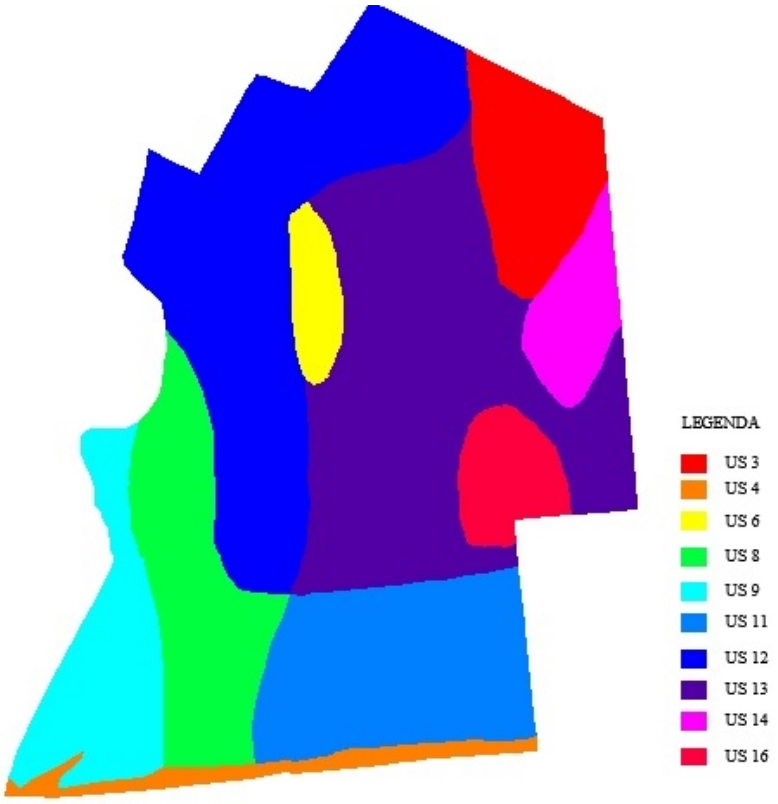

Fig. 10. Thematic maps on land dividing ground units

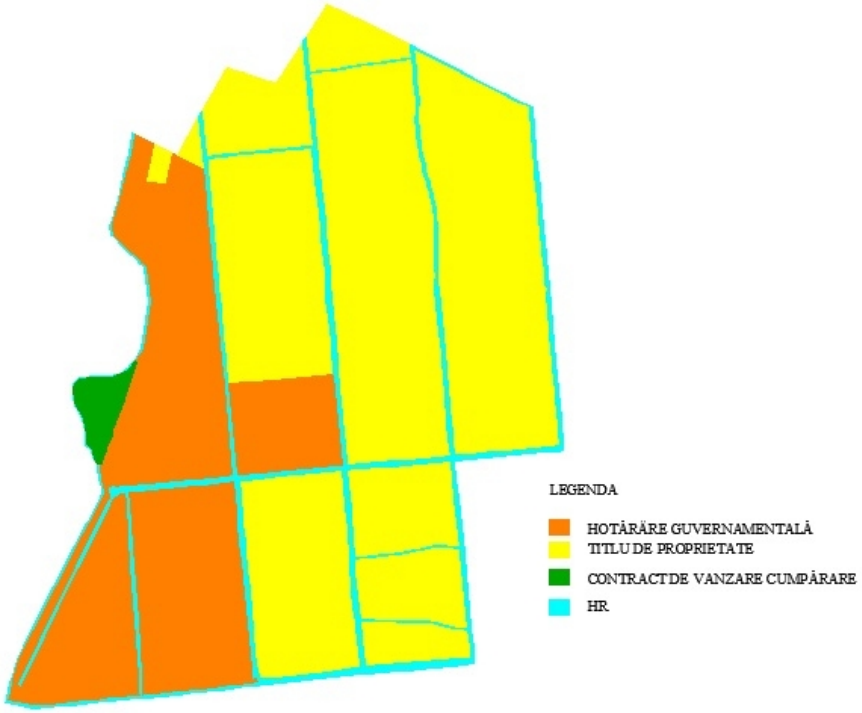

Fig. 11. Thematic Map terrains ownership by type acts

3. Conclusions

The case study aims to resolve issues related to the creation and implementation of cadastral works on agricultural land covering a study area located in the unincorporated commune UAT's Ţuţora. The database created will allow cadastral information system to solve a number of problems in the current activity of a local government.

Making a local information system on agricultural land and a database which will serve to allow coordination of several activities including: property management, management of tax collection, record crop.

4. References

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